



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

SOCIETY OF ARTS.

FRIDAY, OCTOBER 21st, 1853.

MEETING OF COUNCIL.

Wednesday, Oct. 19th, 1853.

AT a Meeting of Council held on Wednesday the 19th instant, the following Institutions were taken into Union :

- 295. Kelvedon, Literary Institution.
- 296. Great Yarmouth, Parochial Library and Museum.
- 297. Hitchin, Mechanics' Institution.

NOTICE TO INSTITUTIONS.

THE Council have much pleasure in announcing that Mr. Seymour Tremere has presented fifty copies of his recent "Report on Mining Districts," and Dr. Herbert Barker (of Bedford) 150 copies of an article on "Medical Meteorology," for distribution to the Institutions in Union. As the numbers are not sufficient to admit of copies being sent to each Institution, it is requested that special application be made for the same.

STATISTICS.

THE Circular and List of Queries proposed by the Society of Arts, 25th July last, with a view to obtaining correct information as to the actual condition of the Literary and Scientific Institutions and Mechanics' Institutes of the United Kingdom, have been duly responded to by about one-third of the whole number. Many of those which have been received have evidently been most carefully filled in, and considerable time must have been occupied in procuring the requisite information for the purpose. But unless a large proportion of the remaining two-thirds are returned, it will not be possible to publish a summary of the replies in that form which was at first intended, so as to show not only the actual extent and importance of these Institutions, but also their predominance in particular districts and counties, so as to enable some deductions to be drawn as to their usefulness in promoting and advancing education.

It is earnestly desired that those Institutions which have not yet made any return to the Queries in question, will do so with as little delay as possible, and not later than the 1st of November; and that the secretaries and officers of Institutions will also urge upon others in their several localities, or to whom they may happen to be known, the importance and necessity of making the returns by the time stated.

EXHIBITION OF INVENTIONS.

MEMBERS and others, who intend to contribute to the Fifth Annual Exhibition of Inventions, are requested to forward their models, specimens, or drawings, on or before the 1st of November next, in order that they may appear in the Catalogue.

COMMISSIONERS OF PATENTS.

THE readers of the JOURNAL are doubtless aware that the late Patent Law Amendment Act, in addition to the sweeping away a variety of antiquated forms, tedious proceedings, reducing the fees, and making them payable by instalments, introduced the machinery of Commissioners of Patents; but many of the readers are perhaps not aware how small a part these Commissioners play in the transaction of the business. The Commissioners unfortunately have had very few duties thrown upon them by the Act; indeed, the constitution of the Commission is such, that it in reality precludes the possibility of any great amount of business being fairly attended to by its members. There is no desire to throw any blame upon them as individuals—the system alone is in fault. In the first place, all the Commissioners except one, the Master of the Rolls, change with every change of Government; there is therefore no guarantee for anything like continuous, regular, or permanent action. In the next place, every individual comprising the Commission is burthened with his own heavy official duties, which leave him practically no time whatever to devote to what ought to be the proper duties of a Commissioner of Patents, and scarcely even to the very few which the Act has imposed on him. It seems, too, as if the framers of the Act were perfectly aware of this, and have therefore studiously avoided giving them any duties whatever, which cannot properly be discharged by a few paid officers under them. The Attorney and Solicitor-General are still left to the duties of examination, and the giving their sanction to the issues of Letters-patent, and to the Lord Chancellor is left the duty of sealing when the Attorney or Solicitor-General's warrant authorizes him to do so.

It is true that the Lord Chancellor, the Attorney and Solicitor-General, are members of the Commission, but in the sealing and examination of the applications for patents they act independently of the Commission, and in their individual capacities, as hitherto. The Commission, in reality, serves for little else than to give its name to an Office where the papers are passed from one officer to another, instead of their being taken by the patentee himself, as in former times: an improvement no doubt, but one which did not require the appointment of a Commission to effect. Even this improvement, too, did not necessarily flow from the Act, but has arisen from the Lord Chancellor having seen the propriety and convenience of fixing the office for transacting his part of the business at the office of the Commissioners. Another Lord Chancellor may think differently, and divide the offices. That there is only one office for the transaction of patent business depends entirely on the will of the Lord Chancellor, who at the present time thinks it right to make one office serve the two purposes. There is one thing certainly consistent; namely, that as the Commissioners of

Patents have nothing to do, they receive no pay. One question is obvious to any one of common sense—Why is not the Patent Office made a reality and not a sham? Why is the Commission not composed of a few competent working individuals, with the requisite staff, competent not only in talent, but capable of devoting all their time to the subject, and with such salaries as will secure the best men for the purpose? The fees received from patents, the experience of one year has shown, would amply pay this cost; and to what purpose could the money be better applied?

What necessity is there for the cumbrous machinery of affixing the Great Seal of England to every grant? A practical inconvenience arises from this necessity of having the Great Seal, besides giving an excuse for mulcting the unfortunate patentee in fees beyond those sanctioned by the Patent Law Amendment Act.

The Lord Chancellor and not the Commission, having the custody of the seal, the sealing of the patent depends entirely on the former officer. Whilst he is in town certain days in the week are appointed for sealing; but in case an applicant requires his patent sealed on any other than the appointed days,—and at times this is necessary in order to save the patent,—what is termed a private seal is required, for which a patentee has to pay a fee of 2*l.* extra. By what authority the fee is exacted is not known, but usage and custom have sanctioned it for many years past. It is worse, too, in vacation or at times when the Lord Chancellor happens to be away from London. It must be remembered that the Great Seal of England is too important an affair to be left behind, but must always accompany the Chancellor wherever he goes; and any document requiring it to be affixed must in such cases be sent to the Lord Chancellor wherever he may happen to be, and in addition to the 2*l.* charge for a private seal, a sum of about 30*s.* is charged for the expense of the documents travelling backwards and forwards to that officer. Arrangements, it will be said, are made at the Patent Office for obtaining the seal during vacation one day in the week, without these extra charges, and no doubt this is so; but if the seal be required on any other day than the one appointed, then the extra charges are made. Now, no one quarrels with the Lord Chancellor for having a holiday, and there is no need here to discuss how far it may be necessary for the Great Seal of England to be kept safely guarded in the actual custody of the Chancellor. It may be, for aught that the uninitiated know to the contrary, that the Chancellor sleeps with the Great Seal under his pillow with Colt's revolvers and a drawn sword by his bed-side. The Great Seal, no doubt, is too important to be entrusted to other hands than the Chancellor himself; but, so far as Letters Patent for Inventions are concerned, there is no need of so costly and powerful an instrument to give effect to them. The simple remedy is, to make the Commission a reality, and not a sham. Appoint two or three competent men, with sufficient salaries; give them a Seal of Office, and let every Patent be sealed with this Seal; enacting by law that Letters Patent, to which such a seal is affixed, shall have the same force

and effect, in all respects, as if sealed with the Great Seal.

Again, during vacation, the law officers of the Crown are constantly absent from town, and all sorts of delays and expenses are unnecessarily incurred in attending upon them; and, whilst in town, their time is so taken up with their professional and parliamentary duties, that it is impossible, be they who they may, that the Patent business can be properly attended to.

Let, then, the Commissioners have full powers to do all that is now done by the Attorney and Solicitor-General; in fact, let the Commissioners of Patents do all that is necessary for the grant of Letters Patent. There can be no difficulty in finding men competent for these duties—at least, as competent as the men who, by virtue of their office as law officers of the Crown, incidentally perform them, whether they have any special qualifications for the duties, or not. It has been gravely argued by the supporters of the old system, that as the law officers of the Crown are the future judges of the land, it is very necessary that they should gain knowledge and experience in matters relating to patents, in order that when they become judges they may be skilled in deciding such cases as may come before them. This argument, though seriously propounded, needs little refutation; as well might it be argued that every Attorney and Solicitor-General ought to spend a portion of his time as a clerk in some city house, in order to render himself a competent judge hereafter for deciding questions of mercantile law.

Common sense at once revolts at the absurdity. Let the law-officers of the Crown keep to their own legitimate business; let the Keeper of the Great Seal still retain that for the great and ponderous duties for which it may be more properly fitted. A much less important instrument will serve the purpose, as far as patents for invention are concerned. Indeed, after all, as the matter now stands, the law-officer's warrant for sealing is the really important instrument: the affixing the Great Seal by the Chancellor, is, so to speak, a mere registering the edicts of the inferior officer. It is true the Lord Chancellor may at the last, on hearing sufficient reasons alleged, refuse to affix the seal, notwithstanding the warrant. That is, he may decide by way of appeal from the decision of the law officer. With a properly constituted commission such an appeal would be unnecessary; or, if thought necessary, there is nothing in the constitution of a Commission which prevents an appeal being retained under proper restrictions.

The working of the Patent Law can never be satisfactory till these anomalies are removed. Make the Commission a reality, a distinct department; put all the Patent business into its hands, and relieve the Lord Chancellor and the law officers of the Crown of their present duties, for which they can at best be only accidentally qualified.

The framers of the Patent Law Amendment Act well knew the proper machinery to be adopted; but the pressure of vested interests was no doubt too strong to enable them fully to develop its capabilities. The public, however, cannot but see the existing absurdities, and the obvious remedy—make the Commission a reality.

METEOROLOGICAL OBSERVATIONS AT SEA.

A Conference was recently held at Brussels, at the invitation of the Government of the United States of America, the object of which was to connect a systematical and uniform plan of meteorological observations at sea. The Conference at Brussels was held with the view of attracting the attention of commercial nations to the subject, and the Report which follows was the result of it:

"In pursuance of instructions issued by the Governments respectively named below, the officers whose names are hereunto annexed assembled at Brussels for the purpose of holding a Conference on the subject of establishing a uniform system of meteorological observations at sea, and of concurring in a general plan of observation on the winds and currents of the ocean, with a view to the improvement of navigation, and to the acquirement of a more correct knowledge of the laws which govern those elements. The meeting was convened at the instigation of the American Government, consequent upon a proposition which it had made to the British Government, in reply to a desire which had been conveyed to the United States, that it would join in a uniform system of meteorological observations on land, after a plan which had been prepared by Captain James, of the Royal Engineers, and submitted to the Government by Sir J. Burgoyne, Inspector-General of Fortifications. The papers connected with this correspondence were presented to the House of Lords on the 21st of February last, and have been further explained in the minutes of the Conference. And it is here merely necessary to observe, that some difficulties having presented themselves to the immediate execution of the plan proposed by the British Government, the United States availed themselves of the opportunity afforded by this correspondence of bringing under the notice of the British Government a plan which had been submitted by Lieutenant Maury, of the United States' navy, for a more widely extended field of research than that which had been proposed; a plan which, while it would forward the object entertained by Great Britain, would, at the same time, materially contribute to the improvement of navigation and to the benefit of commerce.

"An improvement of the ordinary sea route between distant countries had long engaged the attention of commercial men, and both individuals and nations had profited by the advances which this science had made through a more correct knowledge of the prevailing winds and currents of the ocean. But experience had shown that this science, if it did not now stand fast, was at least greatly impeded by the want of a more extended co-operation in the acquirement of those facts which were necessary to lead to a more correct knowledge of the laws which govern the circulation of the atmosphere, and control the currents of the ocean; and that the subject could not receive ample justice, nor even such a measure of it as was commensurate with the importance of its results, until all nations should concur in one general effort for its perfection. But, could that happy event be brought about—could the observations be as extensive as desired, and receive that full discussion to which they were entitled, the navigator would learn with certainty how to count upon the winds and currents in his tract, and to turn to the best advantage the experience of his predecessors.

"Meteorological observations to a certain extent had long been made at sea, and Lieutenant Maury had turned to useful account such as had from time to time fallen into his hands; but these observations, although

many of them good in themselves, were but isolated facts, which were deprived of much of their value from the absence of observations with which they could be compared; and, above all, from the want of a constant and uniform system of record, and from the rudeness of the instruments with which they had been made. The moment then appeared to him to have arrived when nations might be induced to co-operate in a general system of meteorological research. To use his own words, he was of opinion that 'the navies of all maritime nations should co-operate, and make these observations in such a manner, and with such means and implements, that the system might be uniform, and the observations made on board one public ship be readily referred to, and compared with the observations made on board all other public ships, in whatever part of the world; and, moreover, as it is desirable to enlist the voluntary co-operation of the commercial marine, as well as that of the military of all nations, in this system of research, it becomes not only proper, but politic, that the forms of the abstract log to be used, the description of the instruments to be employed, the things to be observed, with the manipulation of the instruments, and the methods and modes of observation, should be the joint work of the principal parties concerned.'

"These sentiments being concurred in by the Government of the United States, the correspondence between the Governments was continued, and finally each nation was invited to send an officer to hold a Conference at Brussels on a given day. And that the system of proposed observation and of combined action might become immediately available, and be extended to its widest possible field of operation, it was determined to adapt the standard of the observations to be made to the capabilities of the instruments now in general use in the respective naval services, but with the precaution of having all these instruments brought under the surveillance of parties duly appointed to examine them and determine their errors; as this alone would render the observations comparable with each other through the medium of their respective standards.

"The Conference opened its proceedings at Brussels on the 23rd of August, 1853, in the residence of M. Piercot, the Minister of the Interior, to whom the thanks of the Conference are especially due. M. Quetelet was unanimously elected president.

"Before entering upon any discussion, it was the desire of all the members of the Conference that it should be clearly understood that in taking part in the proceedings of the meeting they did not in any degree consider themselves as committing their respective Governments to any particular course of action, having no authority whatever to pledge their country in any way to these proceedings. The objects of the meeting having been explained by Lieutenant Maury, the Conference expressed its thanks to that officer for the enlightened zeal and earnestness he had displayed in the important and useful work which forms the subject of the deliberations of the Conference.

"In concerting a plan of uniform observation, in which all nations might be engaged, the most obvious difficulty which arose was from the variety of scales in use in different countries. It is much to be desired that this inconvenience should be removed; but it was a subject upon which the Conference, after mature deliberation, determined not to recommend any modification, but to leave to each nation to continue its scales and standards as heretofore, except with regard to the thermometers, which it was agreed should, in addition to the scale in use in any particular service, have that of the

centigrade placed upon it, in order to accustom observers in all services to its use, with a view to its final and general adoption. The advantages of concert of action between the meteorologist on land, and the navigator at sea, were so obvious, that looking forward to the establishment of a universal system of meteorological observation upon both elements, it was thought that the consideration of scales could with greater propriety be left for that or some such occasion.

" As to the instruments to be recommended, the conference determined to add as few as possible to such as were in common use in vessels of war; but, regarding accuracy of observation as of paramount importance, the conference felt it to be a matter of duty to recommend the adoption of accurate instruments, of barometers and thermometers especially that have been carefully compared with recognized standards, and have had their errors accurately determined; and that such instruments only should be used on board every man-of-war co-operating in this system, as well as on board any merchantmen, as far as it may be practicable. The imperfection of instruments in use at sea is notorious. The barometer having hitherto been used principally as a monitor to the mariner—to warn him, by its fluctuations, of the changes in prospect—its absolute indication of pressure has been but little regarded; and makers seldom, if ever, determined the real errors of these instruments; or, if known, still more rarely ever furnished the corrections with the instruments themselves. That an instrument so rude and so abundant in error as is the marine barometer generally in use should, in this age of invention and improvement, be found on board any ship, will doubtless be regarded hereafter with surprise; and it will be wondered how an instrument so important to meteorology, and so useful to navigation, should be permitted to remain so defective that meteorologists, in their investigations concerning the laws of atmospheric pressure, are compelled in great measure to omit all reference to the observations which have been taken with them at sea. The fact will, it is believed, afford a commentary upon the marine barometers now in use which no reasoning or explanation can render more striking. It was the opinion of the conference that it would not be impossible, considering the spirit of invention and improvement that is now abroad in the world, to contrive a marine barometer, which might be sold at a moderate price, that would fulfil all the conditions necessary to make it a good and reliable instrument; and a resolution was passed to that effect, in order to call the attention of the public to the importance of an invention which would furnish the navigator with a marine barometer that at all times, and in all weathers at sea, would afford the means of absolute and accurate determinations. The Conference is also of opinion that an anemometer, or an instrument that will enable the navigator to measure the force, velocity, and direction of the wind at sea, is another desideratum. The Conference was of opinion, that the mercurial barometer was the most proper to be used at sea for meteorological purposes, and that the aneroid should not be substituted for it.

" With regard to thermometers, the Conference does not hesitate to say, that observations made with those instruments, the errors of which are not known, are of little value; and it is therefore recommended, as a matter well worth the attention of co-operators in this system of research, whether some plan may not be adopted in different countries for supplying navigators, as well in merchantmen as in men-of-war, with thermometers, the errors of which have been accurately deter-

mined. For the purposes of meteorology various adaptations of the thermometer have been recommended, such as those which refer to hygrometry and solar radiation; and, accordingly, a space will be found in the columns for temperature by thermometers with dry, wet, and coloured bulbs. With these exceptions, the only instrument, in addition to those generally used at sea, for which the Conference has thought proper to recommend a column, is that for specific gravity: the cost of this instrument is too insignificant to be mentioned. The reasons for recommending the use at sea of the wet, the white, and black bulb thermometers are obvious; but with regard to the thermometer with a bulb, the colour of sea-water, and the introduction on board ship of a regular series of observations upon the specific gravity of sea-water, it may be proper to remark that, as the whole system of ocean currents and of the circulation of sea-water depends in some degree upon the relative specific gravities of the water in various parts of the ocean, it was judged desirable to introduce columns for this element, and to recommend that observations should be carefully made with regard to it, both at and below the surface. With respect to the thermometer having a bulb of the colour of sea-water, it is unnecessary to say more in favour of its use on board ship than that the object is to ascertain whether or no such observations will throw any light upon the psychrometry of the sea, or upon any of the various interesting phenomena connected with the radiation from the surface of the ocean.

" In bringing to a conclusion the remarks upon instruments, the Conference considered it desirable, in order the better to establish uniformity and to secure comparability among the observations, to suggest, as a measure conducive thereto, that a set of the standard instruments used by each of the co-operating Governments, together with the instructions which might be given by such Governments for their use, should be interchanged.

" The object of the Conference being to secure as far as possible uniformity of record, and such a disposition of the observations that they would admit of a ready comparison, a form of register was concerted and agreed upon. The first columns of this form will receive the data which the Government of the United States requires merchant vessels to supply, in order to entitle them to the privileges of co-operators in this system of research, and may therefore be considered as the *minimum* of what is expected of them. This condition, which it may be as well to state here, requires that at least the position of the vessel and the set of the current, the height of the barometer, the temperature of the air and water, should each be determined once a day, the force and direction of the wind three times a day, and the observed variation of the needle occasionally.

" Every abstract log kept by a merchant vessel should contain at least what is here recommended. Anything more would enhance its value, and make it more acceptable. The remaining columns are intended principally for men-of-war to fill up, in addition to those above-mentioned; but it is believed that there are many officers in the mercantile navy also who are competent to this undertaking, and who will, it is hoped, be found willing to distinguish themselves in this joint action for the mutual benefit of the services. In the compilation of this form, the Conference has had carefully in view the customs of the service and the additional amount of attention which these duties will require; and it is believed that the labour necessary for the purpose, at least to the extent specified in the instructions for filling up the columns, is only such as can be well performed under

ordinary circumstances; and it has considered it a *minimum*, and looks with confidence to occasional enlarged contributions from zealous and intelligent labourers in the great cause of science. The directions for filling up the columns, and for making certain observations, it will be seen by the minutes, were limited to such only as seemed necessary to the Conference to insure uniformity of observation. This subject received the benefit of much discussion before the meeting, and it was considered most advisable to confine the matter to hints, which it is hoped will be found sufficient, when embodied in the instructions which each nation will probably issue with the forms, to ensure that most desirable end, uniformity.

"The Conference, having brought to a close its labours with respect to the facts to be collected and the means to be employed for that purpose, has now only to express a hope that whatever observations may be made will be turned to useful account when received, and not be suffered to lie dormant for the want of a department to discuss them; and that should any government, from its limited means, or from the paucity of the observations transmitted, not feel itself justified in providing for their separate discussion, it is hoped that it will transfer the documents, or copies of them, to some neighbouring power, which may be more abundantly provided, and willing to receive them. It is with pleasure that the Conference has learnt that the Government of Sweden and Norway has notified its intention of co-operating in the work, and that the King has commanded the logs kept by his Swedish subjects to be transmitted to the Royal Academy of Science at Stockholm; and also that in the Netherlands, Belgium, and Portugal, measures have been taken to establish a department for the same purpose, and that the Admiralty of Great Britain has expressed its intention of giving instructions for meteorological observations to be made throughout the Royal Navy.

"The Conference has avoided the expression of any opinion as to the places or countries in which it would be desirable to establish offices for the discussion of the logs; but it is confidently hoped that whatever may be done in this respect, there will be always a full and free interchange of materials, and a frequent and friendly intercourse between the departments; for it is evident that much of the success of the plan proposed will depend upon this interchange, and upon the frankness of the officers who in the several countries may conduct these establishments.

"Lastly, the Conference feels that it would but inadequately discharge its duties did it close this Report without endeavouring to procure for these observations a consideration which would secure them from damage or loss in time of war, and invites that inviolate protection which science claims at the hands of every enlightened nation; and that as vessels on discovery or scientific research are, by consent, suffered to pass unmolested in time of war, we may claim for these documents a like exemption, and hope that observers, amid the excitement of war, and perhaps enemies in other respects, may in this continue their friendly assistance, and pursue their occupation, until at length every part of the ocean shall be brought within the domain of philosophic research, and a system of investigation shall be spread as a net over its surface, and it become rich in its benefit to commerce, navigation, and science, and productive of good to mankind.

"The members of the Conference are unwilling to separate without calling the attention of their respective Governments to the important and valuable assistance

which it has received from the Belgian Government. That the Conference has been enabled to draw its labours to so speedy and satisfactory a close, is in a great measure owing to the facilities and conveniences for meeting and deliberating which have been afforded by His Majesty's Government.

"Signed at Brussels, this 8th day of September, 1853.

| | |
|-------------------|---------------------------------|
| " Belgium . . . | QUETELET, President. LAHURE. |
| " Denmark . . . | P. ROTHE. |
| " France . . . | DELAMARCHE. |
| " Great Britain . | F. W. BEECHY, H. JAMES. |
| " Netherlands . | JANSEN. |
| " Norway . . . | IHLLEN. |
| " Portugal . . . | DE MATTOS CORREA. |
| " Russia . . . | GORKOVENKO. |
| " Sweden . . . | PETTERSSON. |
| " United States . | MAURY." |

CONSUMPTION OF SMOKE.

MR HAYWOOD, the surveyor to the City Commissioners of Sewers, has just made the following Report on this subject. He says:

"I have caused observations to be made of the issue of opaque smoke from the chimney shafts belonging to the brewery of Messrs. Calverts, in Upper Thames-street. The chimney shafts were watched for a period of seven days, from about four o'clock a.m. until seven or eight p.m., an observation being registered every ten minutes. The total number of observations registered was 671; of which 7 record no smoke visible, 85 the smoke scarcely visible, 135 perfectly visible, 193 rather dense, 251 exceedingly dense. Thus about 34 per cent. of the whole number of observations record the issue of exceedingly dense smoke, and 66 per cent. of the whole as dense and exceedingly dense. There are several large chimney shafts to this establishment, the whole of which were watched. The number which were in use at the time varied. The duration of the period of the issue of exceedingly dense smoke was from one to seven minutes, the average appearing to be about three or three and a half minutes; and it may therefore be said to be issuing from Messrs. Calverts' premises for more than two hours daily, and smoke of the two highest degrees of density must have been issuing for nearly half of the busy hours of the day. The smoke from the chimney shaft of the City Flour Mills, situated in Upper Thames-street, having occupied the attention of your honourable Court, I have also directed similar observations to be made there. These observations were continued for six days, between four o'clock a.m., and eight o'clock p.m., and the observations were likewise at intervals of ten minutes noted. The total number registered was 377; of which 21 record the smoke as not visible, 204 scarcely visible, 73 visible, 37 rather dense, 42 exceedingly dense. The duration of the periods of intense smoke was about three and a half or four minutes. About 11 per cent. therefore, of the whole number of observations record the issue of the smoke as exceedingly dense, and 21 per cent. of the whole as of the two highest degrees of density. The persons who took these observations made no inquiry as to the time when the furnaces were lighted or extinguished, nor was information conveyed to the owners that the issue of smoke from the chimneys was being watched.

"The general practicability of almost entirely preventing the issue of opaque smoke from furnace shafts is now so universally admitted, that I need scarcely here re-

assert that it can be accomplished ; yet as it appears probable that before long it may be requisite for you to enforce the abatement of the nuisance by the owners of those furnaces within your jurisdiction who have not yet complied with your notices, it may be useful to submit to you a few points in connection with the subject.

" From the earliest period of the usage of coal as a fuel in the metropolis, the smoke caused by its imperfect combustion appears to have been regarded as a great evil, and in 1819 a select committee of the House of Commons, termed the ' committee on steam engines and furnaces,' was appointed to inquire ' how far it may be practicable to compel persons using steam engines and furnaces in their different works, to erect them in a manner less prejudicial to public health and public comfort ; ' it was, in fact, to inquire into the practicability of preventing the issue of opaque smoke, and the committee having elicited the opinions of qualified judges, appear to have arrived at the conclusion that the nuisance might at least be considerably diminished, if not altogether removed.

" In 1843, a select committee of the house, and in 1845, another select committee was appointed on smoke prevention. From them the subject received the fullest investigation ; a large amount of evidence being taken from numbers of witnesses, in every way competent, from their scientific and practical knowledge, to give information, and it resulted in the most confident expression of opinion from those committees in the practicability of economically preventing the issue of opaque smoke from furnaces and steam engines ; and the Health of Towns Commission, in 1845, concurred in this opinion, and in the propriety of an immediate legislative enactment upon the subject.

" In the year 1846, Sir Henry De la Beche and Dr. Lyon Playfair, who were specially charged by the Government with inquiring into the question of smoke consumption, reported its almost universal practicability, appearing indeed to except only certain descriptions of furnaces, where, from the nature of the manufactures, combustion is effected under peculiar and special circumstances, hindering the application of those principles upon which the effectual prevention of opaque smoke depends.

" The whole of these commissions of inquiry may be said then to have concurred in opinion as to the practicability of smoke prevention, their opinions being formed and matured after hearing evidence from the most competent witnesses who could be found. The result of these various investigations has been that local acts for suppressing the issue of opaque smoke have been obtained by Manchester and Liverpool, Derby, Birmingham, and other provincial towns, at some of which places the smoke has been prevented to a very large extent. The first act for the prevention of the nuisance within the metropolis was obtained and put into operation within the City of London in 1852, and up to the present time notices have been served by this commission upon the owners of about 120 furnaces, and the issue of smoke has been from the majority of these considerably abated, although in all cases the abatement has not yet been so perfect as may be practicable, or as the act appears to require. These 120 furnaces comprise the whole of those within the City, the chimneys of which formerly vomited forth the densest volumes of opaque smoke.

" The practicability of consuming smoke is, therefore, no longer a matter of speculation, as within your own jurisdiction various successful instances may be appealed to, and in some of the provincial towns named they are

both numerous and remarkable. There is, however, one metropolitan example worthy of special reference, and if any doubts still exist upon the point, I think that a visit to the brewery of Messrs. Truman, Hanbury, Buxton, and Co., Brick-lane, Spitalfields, would be most convincing. I have myself visited the establishment, and can personally testify to the almost perfection of combustion and freedom from smoke which are attained there. There are fourteen furnaces connected with twelve chimney shafts upon that establishment, which are fitted up with smoke-consuming apparatus. The first furnace was fitted up experimentally early in the year 1848, and its complete success caused the gradual introduction of the principle to the remaining furnaces. There are generally thirteen furnaces at work daily, and the consumption of coals is about 6,000 tons per annum. The total cost of fitting up the furnaces was about 3,000*l.*, and the annual expense of repairs about the same as it was to the furnaces before their alteration. These details have been obligingly given to me by Mr. Frazer, the engineer to the brewery. At the time of my visit (which no one could have anticipated, as, until presenting myself at the office and requesting permission to inspect the furnaces, I had not signified my intention to any one) I found most of the furnaces at work ; but the smoke was scarcely visible from any one of the chimney shafts ; and from some of them so slight was the issue, that it was not easily ascertainable whether the furnaces connected with them were at work or not, although that such was the case I afterwards verified ; and when I looked up through two shafts, which are about 70 feet high, from the door by the furnace mouths, so free were they from smoke that although one furnace was consuming at the rate of 3 tons of coal per diem and the other at the rate of about 10 cwt. per diem, the sky was perfectly visible ; and birds, had they been flying over the tops, might have been distinctly seen. I was informed that this freedom from opaque smoke was maintained throughout the day, with the exception of two or three occasions of about four minutes each, when from processes in the brewing the fires required temporarily suppressing, and that the smoke was perfectly consumed within a quarter of an hour after the furnaces were ignited in the morning. I think that I can add nothing more in verification of the practicability of consuming opaque smoke, and the gratuitous and disinterested public communication recently made by Messrs. Truman, Hanbury, and Co., that this smoke consumption has enabled them to effect a saving of about 2,000*l.* per annum, must place the economy of effecting a perfect combustion beyond doubt, and most certainly so in the case of establishments at all parallel in extent and other conditions. That there is no loss sustained by the adoption of means for consuming smoke abundant testimony is to be gathered from the provincial towns before named.

" There are various causes for the production of opaque smoke from furnaces ; irregular and careless firing, over stoking, want of draught, &c., may each cause it, as well as the urging of the furnaces, and forcing the boilers beyond their legitimate powers (one which, I apprehended, would upon inquiry be found to have been a most fertile cause within your jurisdiction). The cures, therefore, will be more or less difficult and expensive, and must be sought in the application of one or other of those remedies of which there are now many, and which must be applied according to the exigencies of particular cases ; but with the causes of smoke, so with the modes of cure, I need not detain you, for as the practicability of its prevention is now an established fact, the business of the commission as regards smoke

may be almost said to be with the tops of the chimney shafts alone, from which it is perfectly manifest that with proper appliances and sufficient care opaque smoke need issue but for a very few minutes daily, the chimneys of those manufactories where the combustion of fuel is made under peculiar circumstances being alone exceptional."

ARTIFICIAL PEARLS.

AN oyster, or rather a water muscle, in which the artificial pearls are formed by the Chinese, has recently been sent to this country. These pearls are only obtained near Ning-po, and until lately very little was known of the manner in which they were formed. The *Hermes* steamer, however, on a late visit to that place, was able to obtain several live ones, in which, on being opened, several pearls, as many as eighteen or twenty, were found in the course of formation. The one sent only contains simple pearls adhering to the shell. It appears they are formed by introducing some pieces of wood, or baked earth, into the animal while alive, which, irritating it, causes it to cover the extraneous substance with a pearly deposit. Little figures made of metal are frequently introduced, and, when covered with the deposit, are valued by the Chinese as charms. These figures generally represent Buddha in the sitting posture, in which that image is most frequently portrayed. Several specimens have, it is said, been preserved alive in spirits, and others slightly opened, so as to show the pearls. The Society has reason to believe that it will shortly receive a more detailed statement, accompanied with specimens, in reference to this interesting fact.

TRADE SCHOOLS.

THE Rev. Henry Moseley, M.A., F.R.S., Canon of Bristol, and one of Her Majesty's Inspectors of Schools, has just addressed a letter to the Committee of the Bristol Diocesan Society, on the best means of giving efficiency to the Bristol Diocesan School, in which the following passages occur :

"The school having been established for the benefit of education generally in Bristol, it occurs to me that—under circumstances which appear in some measure to have superseded its use as an ordinary elementary school, of the same description as the parochial schools which surround it,—it would be expedient to offer in it a course of instruction of a different kind from the instruction given in those schools, and to make it supplementary to them. What I propose will perhaps better be understood if I remind you of the fact that in ordinary national schools there are commonly some boys in advance of the rest, and capable of receiving instruction of a higher kind, which could not be given to them without occupying more of the time of the master than is compatible with the general routine of the school, and probably with the objects of the promoters. It would, I think, be a useful function of the Diocesan schools to offer to this class of boys, in a separate school, a special course of instruction of a practical kind, having reference to the mechanical and manufacturing callings and the trade of Bristol.

"The attention of the public has been directed (as the Committee will probably remember) to the subject of trade schools by various public meetings held at the

Society of Arts, by a conference of the representatives of the municipal towns, at the Mansion-house in London, and by the establishment of a department of the Board of Trade specially for the encouragement of schools of this class.

"To ascertain how far there is occasion for the establishment of a trade school in Bristol, and what means the city supplies of supporting it, I have referred to the Bristol Directory, and counted up the number of manufacturers, tradesmen, and master-workmen, the principles of whose manufacturing or mechanical pursuits or trade require—to be thoroughly understood—a knowledge of certain elementary principles of science which might be taught in a trade school; and I find the number to be 1708.

"This list I have divided into three groups. The first contains the trades, 18 in number, which are connected with building. There are 750 tradesmen in this group. The department of School instruction adapted to youths intended for any of the trades composing it, will be understood by a reference to the 'Builders' Price Book.' It is sufficient to say that youths might, at such a school as I propose, be thoroughly familiarised with measuring, and made to acquire facility, precision, and accuracy, in all the various calculations referred to in that book; and might further be made to comprehend the principles on which those calculations are founded. If in addition to this requirement they were instructed in levelling, in geometrical drawing, in taking plans, and in those principles of experimental science which are connected with ventilation and sewerage, and with the lighting and heating of buildings, they could not fail to enter on the trade of the builder with great advantages to themselves and to the public, as compared with other persons who have received no such previous instruction.

"The second group contains 72 trades, giving occupation to 600 manufacturers or tradesmen, whose pursuits come under the general designation of mechanical pursuits, and require—that the principles on which they depend may be understood—an elementary knowledge of mechanism, and of the science of practical mechanics.

"The third group includes 62 trades or manufactures, giving occupation to 358 manufacturers, or tradesmen, dependent upon the experimental sciences, and, more particularly, upon chemistry; of which science each is, in fact, little more than an application.

"I am far from alleging that a knowledge of these various branches of science is necessary for carrying on the different trades which I have enumerated. But I do allege that if carried on, in ignorance of such branches of science, they are carried on in ignorance of the principles on which they rest; and that whoever so carries them on, misses that opportunity for the improvement of his mind which is supplied by the daily habit of reasoning and understanding on what he is about; that he fails of one of the highest pleasures of which the human mind is capable—that of thus reasoning and understanding; and that he is wanting in that which is a legitimate source of moral dignity and self-respect. I allege further, that, taken collectively, these trades cannot but suffer, in a commercial point of view, from an ignorance on the part of those who carry them on, of the principles on which they depend—it being impossible but that new and improved processes of art and manufacture and expedients of construction should result from such knowledge.

The Rev. Mr. Moseley then goes on to recommend that a navigation school should be united with the trade school, as having a direct bearing upon the trade of Bristol; and states, that "the experience of the Royal Naval

Schools at Greenwich Hospital has shown that a sound knowledge of this science, in theory and in practice, may be communicated to boys of fifteen years of age ;" and that by this knowledge they become better conducted and more efficient sailors than they otherwise would be. It is recommended that the school should be thrown open generally to the inhabitants of Bristol, as small tradesmen, the higher class of mechanics, warehousemen, &c., &c., whose children may not have attended national schools, would be likely to avail themselves of it.

With reference to the expenditure requisite for the establishment and maintenance of the school, Mr. Moseley states, that that department of the Board of Trade, which is specially established for promoting this class of schools, will supply the requisite diagrams, models, &c., at half price. "The Committee of Council on Education has also offered to elementary schools under inspection—and will probably extend to trade schools, constituted as *this* is proposed to be, as *advanced national schools*,—grants for the purchase of philosophical apparatus, to the extent of two-thirds of the cost ;" and "will also probably give a grant in aid of *alterations* in internal arrangements, desks, fittings, and augmentations of salary to the masters, provided that they have received its certificates ; and it will give stipends for the support of apprentice pupil teachers." The probable scale of expenditure would be : Salary of head master, 100*l.* and house ; salary of second master, 80*l.* ; incidental expenses, 40*l.*—total, 220*l.* The services of occasional teachers, in addition to those constantly employed, would be necessary, as the present masters do not possess the *technical knowledge* which such a school would require. The arrangement which, under these circumstances, would, perhaps, be found practically the best, would be to seek a head master who, besides being a good teacher and school-keeper, should have a general knowledge of experimental science and of practical mechanics. The second master should be obtained from the Greenwich Hospital schools, where there is a body of pupil teachers training to become masters of navigation schools. He would teach the navigation class ; and, as he would be a good mathematician, he could, so long as the numbers are small, take besides this class, the class of the trade school corresponding to the first group of trades, those connected with building, whilst the head master took the other two groups.

For certain technical branches of instruction, and especially in the commencement of the school, occasional teachers would be necessary. In regard to the building trades, "A young architect or surveyor, who could spare an hour two or three times a week, to attend at the school, to give a short lecture in explanation of practical details, would fully answer the purpose. All the rest would be done by the head and second masters. The same is true of the trades and manufactures included under the other groups, except that no single person would certainly be found capable of explaining the practical details of all the trades in either of these groups ; although in each group different individuals would probably be found willing to give lectures in their own specialities. The best way of providing for this technical instruction, would, I think, at first be to fix a certain sum as the remuneration of each lecture or lesson, and to embrace such opportunities as might arise of getting competent persons to give such lessons. The sum so fixed might be ten shillings. To provide for the expense of these technical lessons, the guarantee offered by the Board of Trade might be asked. If two such lessons were given in each group of trades per week, the cost

would be (taking forty weeks in the school year) 120*l.* per annum. For the mathematical, the mechanical, and the experimental sciences, which are the basis of all these trades, the masters permanently employed in the school must be held responsible. If, as is probable, the Committee of Council consent to apprentice pupil teachers in the school, or to allow stipends to assistant teachers ; one of these should be employed by each lecturer or master, as, what is called, a repeater (*répetiteur*) in the French schools. He is an officer whose business it is to assist at every lecture, to make himself thoroughly master of it, aided by the lecturer's explanations and notes, and to reproduce or repeat it to the class, giving them fuller explanations, impressing it more fully on their minds, and, as it were, compelling the reception of it. It is to be understood that the salaries of these pupil teachers would be paid altogether, and those of the assistant teachers in part, by the Committee of Council. One part of the day (probably the afternoon) should be devoted exclusively to technical and the other to general scientific instruction.

"An educational standard should be fixed for admission ; which, for the present, may be reading, writing, and arithmetic as far as the rule of three. The fee should, I think, be sixpence per week, or five shillings per quarter, for the sons of workmen and tradesmen not employing journeymen, and one shilling a week, or ten shillings per quarter, for the sons of persons above that grade.

"The number of separate establishments in Bristol, in which trades or manufactures, in some degree dependent on scientific principles, are carried on, being 1,708, and some of these employing upwards of a hundred men—it is not perhaps too much to assume that, connected with each, there would on the average be not less than three persons in a condition to avail themselves, for their children, of the education of the trade school, and who would derive benefit from doing so. If we include in this number those persons who, although not themselves employed in these trades or manufactures, are desirous that their sons should be employed in them, it is, I think, certain that this estimate is not in excess. This will give 5,124 heads of families interested in the school, and in a position to benefit by it. It is not too much to assume that 150 boys would be collected from 5,124 families. Fifty scholars might also not unreasonably be calculated upon for the navigation school, which would give a total of 200 scholars. The fees of these scholars, at an average of 9*d.* per week each, would amount to 300*l.*, and this with the present funds of the school, if continued, would probably provide for its maintenance.

"In conclusion, I am desirous to call the attention of the Committee to the benefits which the surrounding National-schools may be expected to derive from the establishment of the Trade-school. As, in the course of time, tradesmen, masters of ships, &c., might be expected to give the preference to boys educated in this school ; to obtain an exhibition to it, could scarcely fail to be considered among the boys of a National-school a reward. Thus a motive to remain longer at school would be afforded ; and a public opinion of the school favourable to learning, as a means of advancement in life to a poor boy, would be created. The character of the instruction in the National-schools of Bristol could scarcely, moreover, fail to be influenced by that of the trade school, receiving from it a more useful and practical bearing upon the pursuits of workmen, and the objects amongst which their lives are passed, so as to cause the occupations of after life to carry on the edu-

tion of their minds which was commenced at school, and which at present ceases altogether with school, their school-life being wholly unconnected with the avocations which follow it. The name of the school should, I think, be "The Bristol Trade and Navigation School." It would be expedient eventually to establish an evening trade school and an evening navigation school. But another staff of masters would be required for this, and a distinct expenditure. It would be impossible that the same master could teach both schools so as to do justice to them."

HOME CORRESPONDENCE.

ON THE PRESERVATION OF GRAIN.

"When in one night, ere glimpse of morn,
His shadowy flail hath thresh'd the corn
That ten day-labourers could not end."

SIR.—The mode adopted in this country for storing and preserving the produce of our yellow crops is extremely rude and slovenly; and is, no doubt, the same as it was in the dark and semi-barbarous ages when bricks and mortar were rarely used, excepting for the castles and mansions of the old feudal barons.

In passing through any of our great agricultural districts it will be seen by the most superficial observer, that farmers either on a large scale, or in the small way, are but poorly provided with barn room. The barn, now as formerly, is merely a covering for the old-fashioned threshing-floor, and is capable of containing but a very small portion of the crop, the whole of which, with that trifling exception, is stored outside in the shape of wheat ricks, barley mows, and oat stacks, exposed to all the inclemency of our very variable climate, and liable, beside, to be destroyed wholesale by all manner of vermin. At the present time, notwithstanding the vast increase of agricultural produce, the barn remains still of the same dimensions, with a forest of stacks and ricks, wholly unprotected from weather and vermin, for four or five years.

The only mode of storing and preserving corn, compatible with true economy, is in its clean state on a granary floor so constructed with proper traps and hoppers, that the grain may be quickly and easily swept down into winnowing machines below, and thence hoisted up to another floor previously cleaned and whitewashed. For new grain it would be requisite to perform this operation about once in every three weeks for the first two or three months, but afterwards twice or thrice a year would be quite sufficient. The expense of the granary and manual labour would be amply compensated in three or four years, by getting rid of the enormous loss necessarily attendant on the rick system. We constantly hear of thousands of rats dead and alive being found by farmers on opening their ricks, which are not unfrequently in such a pestilential state that the owners would willingly set fire to them if it were not for fear of the surrounding property, and it has happened that a man in attempting to remove the thatch of an old rick, has fallen through to the floor, nothing being left of the rick but an empty shell.

Unfortunately, actual loss of corn is not the only mischievous result of the rick system. We are always complaining of the rascally bakers for supplying us with bad bread; but what can they do, while the farmers and millers together supply them with flour made from overheated wheat, browned with age, rottenness, and rats—and seasoned with the putrid carcases of themselves and

their enemies? To convert such stuff into white, I cannot say wholesome, bread, the bakers must use large quantities of alum, and throw in plenty of ammoniacal and alkaline mixtures to make it rise: but let any one procure some newly-reaped wheat, and have it ground pure by itself, *if he can*, and he will find that the flour of such wheat will produce bread as white as snow, and as light as puff-paste without any chemicals whatsoever.

It is true, that bakers use flour made from the oldest wheat in preference to that made from new, because flour made from old wheat requires more water to make up the dough; and it is to the interest of the baker to sell as much water in proportion to the flour as he possibly can. No great harm would result from this practice, if the wheat had grown old on the granary floor, but not in the wheat-rick. I have eaten good bread made from wheat fifty years old, preserved in the magazine granary of a fortress.

As it would be preposterous to suppose that barns could be built of sufficient capacity to receive the whole produce of a farm in the straw, the rick system must be continued; only the farmers must be prepared with powerful steam threshing machines (now, happily, quite common), and thresh out the whole of their crops as soon as possible after reaping, and store their corn in granaries, one of which might serve several neighbouring farms.

It is melancholy to think that the price of bread, the staff of life to the poor, should be enhanced by such slovenly management; but the farmers are not alone to blame, seeing that hundreds, nay, sometimes thousands of quarters of corn are annually shot into the Thames, from the numerous granaries up and down the river banks; partly from mismanagement and improper corn stores, as well as from an idea that the increased price of the better sorts may more than compensate for the loss upon inferior.

I am, Sir, yours obediently,

HENRY W. REVELEY.

Poole, Oct. 20th.

PROCEEDINGS OF INSTITUTIONS.

BASINGSTOKE.—The commencement of the thirteenth Lecture session of the Mechanics' Institute took place at the Town-hall on Wednesday, 12th inst., when the opening lecture was delivered by the Rev. Joseph Wyld, of Southampton, on the "Life and Character of William Penn." The reverend gentleman pourtrayed the principal characteristics which distinguished Penn during a long and eventful life, pointing out with what fearless moral courage and perseverance he successfully combated the many trials and persecutions which assailed him, and his religious principles under the most trying and distressing circumstances. The Lecturer also explained the unceasing exertions of Penn to be "useful in his generation," and his anxious endeavour to assist and ameliorate the condition of his fellow-man, irrespective of country or creed; boldly coming forth as the champion of freedom of thought, and the unflinching advocate of civil and religious liberty throughout the world, at a time when bigotry and intolerance persecuted and imprisoned all who dared to think and act for themselves in matters of religious faith.—A special general meeting was held on Thursday evening for the purpose of electing a President, in the room of Edw. Lefroy, Esq., whose protracted illness obliged him to resign that office, after holding it since the establishment of the Institute in 1841. Wyndham Portal, Esq., of Maltshanger House, was unanimously elected to the vacant chair.

BLAIGOWRIE.—The Introductory Lecture of a course in connection with the Blairgowrie and Rattray Mechanics' Institution was delivered here on Tuesday, the 11th October, by the Rev. J. S. Barty, D.D., of Bendochy, who had chosen for his subject, "The Mind, and how to use it." The rev. gentleman was introduced to the audience by the President, and riveted the attention of a numerous assembly by the power, clearness, and pathos of his lecture. The course of lectures at this Institution are given gratuitously by clergymen and gentlemen in or near the locality, which shows what may be done even in a thinly-populated country, if local talent is enlisted in behalf of such societies.

BRIGHTON.—The Sixth Course of Lectures at the Mechanics' Institution was commenced on Thursday evening, 13th inst., when Mr. C. J. Bond, Vice-President, gave an interesting lecture on the "Influence of Music," assisted, in the vocal department, by Mrs. Bond and Mr. J. Marshall, whose execution of the various duets and songs, &c., called forth the applause of a numerous audience. The Chairman, Mr. Cordy Burrows, in his opening remarks, alluded to the sad loss the Society had sustained in the death of the Rev. F. W. Robertson, to whom much of the present prosperity of the Institution was owing. The Society was stated to be in a most prosperous condition, the number of its members being rapidly increasing. The Library contains 2,200 volumes, and the circulation of books during the last six months exceeded 4,000 volumes.

CHICHESTER.—On Wednesday, the 12th instant, the introductory Lecture of the session was delivered before the members of the Literary Society and Mechanics' Institute, by the Rev. J. Fullagar, "On Light: its Laws, and Properties." The Lecturer prefaced his subject by remarking that he had cheerfully responded to the invitation of the Committee to open the present session, in order that he might demonstrate that the interest he felt in the present amalgamated Society was not less active and real than that he had always manifested in regard to the success of the original Mechanics' Institution; and that he had selected the subject of "Light" for their consideration, as he was anxious to introduce something of a scientific character into the course of lectures, in which merely literary subjects predominated. He then proceeded to treat of light—its sources and nature. On the latter he remarked that the Newtonian theory of luminous atoms was now in less favour among scientific inquirers than the Huyghenian doctrine of undulations; but that the subject was beset with difficulties, and in reality little or nothing was positively known respecting the intricate question as to the essence or nature of light. It was otherwise, however, with regard to its laws and properties, which had been determined by experiments with great exactitude. The lecturer then explained that light, in traversing the same medium, is transmitted in straight lines—that in its passage through media of different density it is bent out of its direct course, or refracted. The laws of refraction were then investigated, and the application of this principle shown in the construction of lenses and optical instruments. The velocity of light was next considered, when it was explained that by means of the eclipses of Jupiter's satellites, astronomers have proved that light travels the whole diameter of the earth's orbit in sixteen minutes, and consequently that it has a velocity of 200,000 miles in a second. The analysis of light by the prism was then elucidated, when it was shown that a ray of light could be resolved into the seven colours of the rainbow, which, however, according to the opinion of some philosophers, were again reducible to three primary ones. The lecturer

then addressed himself to the explanation of the structure of the eye, and the functions of its several parts, in which the arrangements of nature for acquiring distinct vision are so beautifully exemplified. Much curious information was afforded as to the means employed for protecting the delicate organ from the chances of injury, and also the remedies which science had discovered for obviating the inconvenience of occasional defects. Its modifications, too, according to the respective wants, habits, and instincts of men, animals, birds, and insects, were pointed out, and illustrated in some striking instances. The polarization of light, and the phenomenon called the *mírage*, were next briefly referred to, and the discourse, which abounded in instructive matter, was concluded with some reflections on the marvellous beauty and perfection of light, and the softening and tranquilizing influence of eventide twilight, which, remarked the reverend gentleman, spoke in accents to the meditative mind more powerful than the eloquence of a Demosthenes. The lecture was listened to with great attention, and at its close was very warmly applauded by a numerous audience.

LEEDS.—The Committees of the Yorkshire Union of Institutes, the Leeds Mechanics' Institution, and other friends of education, met in the Council-room, at the Court-house, on Wednesday, October 12th, to confer with Mr. Hugo Reid on a variety of suggestions published by that gentleman, and designed to approximate Mechanics' Institutions to People's Colleges. The chair was occupied by Mr. Wheelhouse, the President of the Mechanics' Institution. Mr. Reid, on being called upon, said, that on his plan he did not propose to deal exclusively with mechanics, but that he wished to embrace all classes, who, from their condition, terminated their school education at fifteen years of age. Mr. Reid then entered at length into the details, which were given in a recent Number of the Journal; explaining, that he thought it desirable that there should be a regular course of lectures, extending over about eight months, and continued for three years, and private classes, in which the teacher should meet a few pupils, and give them direct aid in the prosecution of their studies. With respect to the means of carrying this out, he was aware there might be many difficulties; the returns showed that about a tenth of the population were between fifteen and twenty-one years of age—this would give 10,000 in a population of 100,000. Now, it was quite possible that 4 per cent. of these, or 400 pupils, could be obtained, who, at a fee of 10s. each for a course, would pay 200*l.* a year; then if a fourth of these attended a private course at the same rate, it would add 25*l.* a year. This would be sufficient to remunerate one teacher; but as it was desirable that a lecturer should only treat of subjects with which he was fully conversant, it would be better to start properly with two; this would render it necessary to obtain about 150*l.* a year to aid in starting the scheme, which, however, he believed would ultimately prove self-supporting. The Chairman said that, as a practical man, he could not see his way to the realisation of the 400*l.* a year for two lecturers; and he feared that the range of subjects which must be assigned to each would be so numerous that they would be apt to be, as Yorkshire folks say, "Jacks of all trades, and masters of none." Mr. W. Beckett, M.P., said, it appeared to him that Mr. Reid's plan contemplated the mixing of classes, while he believed such institutions were originally only concerned with the industrious class. Whether this union could be effected with advantage, was a question to be determined by the experience of the meeting. The point to which he thought attention should be directed was, that

there is at present no stimulus to improvement; and he believed that many who attended such Institutions went away without having any opportunity of showing the improvement they had made. If the funds would afford it, more paid teachers were certainly desirable. At the same time, Mechanics' Institutions had worked well, and arrived at a point which could scarcely have been expected; and he thought we should be cautious in the introduction of anything that would destroy the popularity which had hitherto marked their progress. He concluded by moving the following resolution: "That this meeting, being convinced of the desirableness of improving and extending the studies pursued in Mechanics' Institutions, and especially of rendering them more systematic and efficient, recommend that, wherever practicable, the attention of the committees of such Institutions should be directed to this object." Mr. Baines, in seconding the resolution, thought we could scarcely build on so large a class as Mr. Reid somewhat sanguinely anticipated. He had no reliance on mere numbers, and he had also great fears, on the ground that so many young men changed their places of employment in the few years after they left school. A reference having been made to Government aid, Mr. Baines said he could not be a party to any system which would make literature and science dependant on a Government. The resolution was carried unanimously. Mr. James Hole quite agreed with Mr. Beckett and Mr. Baines, thinking that the present advantages of Mechanics' Institutions should not be altered, but added to. So far as they had failed, it was for want of systematic instruction. The experiment had been tried successfully at Glasgow, Edinburgh, and Huddersfield; and he did not think it difficult to get even working men to pay 10s. or 1l. per annum for good instruction. He concluded by moving the following resolution, which was subsequently carried unanimously: "That the cordial thanks of this meeting be given to Mr. Hugo Reid for his attendance on this occasion, and for the very full exposition of his views on the important subject of extending and systematising education in Mechanics' and similar Institutions with which he has favoured this conference." Mr. Wilson considered all the Institutions in the town for education deficient. If a first-rate educational Institution were established in the town for the sons of the better classes, the services of the teachers could be secured to give the instruction desired to the youth of the middle and working classes. Mr. Traice concurred in Mr. Wilson's suggestions.

On Monday and Wednesday evenings, Mr. Reid lectured on "The Reception of Great Discoveries," and on "The Popular Study of Astronomy." The first lecture treated of the discouragement and even persecution to which many of the greatest benefactors of mankind had been exposed in consequence of their having given great discoveries to the world. Narrow motives of self-interest had often been the occasion of this; but it was still more frequently the result of miserably imperfect education, of a reluctance to forego cherished opinions, of a dislike to have the settled order of ideas subverted, and above all, of a repugnance to own we are in the wrong. It behoved us to be watchful of ourselves in forming opinions, and especially in refusing to accept new truths, and where there was improbability we should suspend our judgment, and never decide in the negative upon imperfect or *a priori* reasoning.—On Wednesday, Mr. Reid lectured on the "Popular Study of Astronomy," advocating the acquisition of broad views of the mechanism of the heavens by direct observation with the naked eye, and by constant association of interesting pheno-

mena with the changes of bodies in space, such as the limit of the area on the earth, in which the sun can ever be directly over head, the terminal line of illumination; and the mode in which it defined day and night in the several zones of latitude, and the comparative changes of relative position which could be observed by watching the moon and planets from any fixed point. By these means he believed it possible for any person to obtain an excellent idea of those vast phenomena, upon the exact observance of which so many important discoveries in science, with such useful applications, especially to navigation, were based.

SHIFFNAL.—On Friday evening, the 14th instant, Mr. E. Wheeler, delivered a Lecture to the members and friends of the Mechanics' Institution, on "The Curiosities of Insect Life."

TAMWORTH.—At the annual meeting of the Midland Association of Mechanics' and similar Institutions, which is to be held at Tamworth on Tuesday, the 25th inst., the following will be the order of the proceedings: The delegates from the associated Institutions of the seven midland counties will meet in the Town Hall at half-past twelve o'clock. The chair having been taken by the Earl of Yarborough, the President for the year, and the report read by the Hon. Secretary, the officers for the ensuing year will be appointed, when the President elect, Sir Robert Peel, Bart., will be called to the chair by the retiring President. Questions of interest to Mechanics' Institutions will then be discussed, and reports of local improvements, &c., brought before the meeting. A dinner will be provided for the delegates, and in the evening there will be a conversazione, in which the following noblemen and gentlemen are expected to take part: Sir Robert Peel, Bart., President; the Earl of Yarborough; Lord Hatherton; Sir Charles Fox; Charles Adderly, Esq., M.P.; M. T. Bass, Esq., M.P.; W. Scholefield, Esq., M.P.; Dr. Lyon Playfair, C.B.; Wilson Overend, Esq., Deputy Lieutenant of the West Riding; the Mayors of Tamworth, Birmingham, Derby, &c.

WHITCHURCH.—The Mechanics' Institute held its opening meeting for the season, on Tuesday evening last, at the National School (the use of which was generously granted by the Committee), when a Concert was kindly given by the Whitchurch Choral Society, assisted by some of the members of the Ellesmere Choral Society, in aid of the funds of the Institute. The Concert was conducted by Mr. C. F. Bird, the leader of the Choral Society.

TO CORRESPONDENTS.

Errata.—At page 479, first column, line 21 from top, for 5,350,000 tons, read 5,350,000 quintals (= 100 lbs.), which would give 238,839 tons; and line 24 from top, for alone export 30,000 tons, read, export a large portion of the 30,000 tons annually exported.

Notices of the Leamington, Southampton, and Windsor Institutions, are in type, and will appear next week.

MISCELLANEA.

WOOL FROM THE VEGETABLE KINGDOM.—The name of vegetable wool has been applied to a fibrous material which the ingenuity of Mr. Pannewitz has succeeded in extracting from the leaves of the fir. A manufactory of this material has for some time past existed near Breslau, in Silesia, in a district termed the "Prairie of Humboldt." The species of pine there operated upon, is the *pinus sylvestris*, or wild pine; it would seem that every member of the pine tribe might be

turned to similar account. The leaves of these trees, if examined, will be found to be made up of a fibrous material, held together by a resinous substance. The latter may be dissolved out by means of alkalies, leaving the woolly matter behind. Coverlets, blankets, and other articles made of vegetable wool, have long been employed in Austria, Vienna especially, in some charitable institutions. The materials are warm, durable, and agreeable to the eye; moreover, they enjoy the excellent quality of preserving a certain balsamic and rather agreeable smell, which, nevertheless, is so inimical to insects, that they never harbour in it. In the Silesian manufactory, the resinous matter holding the woody fibres together is also turned to account, medicinal baths being made with it as a basis, and which are found to be useful in many chronic diseases.—*Polytechnic Journal*.

A NEW KIND OF COTTON.—The editor of the *Tribune* has seen a specimen of a new and very beautiful sort of cotton, brought from among the Pine Indians of New Mexico by an officer of the Mexican Boundary Commission. Its peculiarity consists of a fine, silky staple, superior in length and strength to all kinds previously known. The seed has been introduced into Texas, and the plant will soon be grown there extensively. It has also the great advantage of not degenerating, and not requiring a renewal of the seed. The plant, if all these peculiarities are proved permanently to belong to it, must effect a revolution in cotton raising. —*American Paper*.

HARRISON'S PATENT WATER AND SPIRIT METER.—In this instrument, the liquid in passing through the meter, acts in two opposite directions against two flexible diaphragms placed between chambers, into which it is alternately admitted; thus displacing at every movement from the one chamber, a quantity of liquid equal to that admitted into the other. This action gives motion to spindles, which is ultimately communicated to the registering hands, and thus the dial of the meter shows accurately, at a glance, the quantity drawn off in gallons, quarts, pints, &c. The instrument is said to be simple in construction, certain in action under any pressure, and requiring no regulator to govern its movements, the apparatus may be connected at once to the main or to the cask, and the quantity sold or drawn off at any part of the premises duly registered.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

From Gazette, 14th October, 1853.

Dated 11th July, 1853.

1651. F. L. Bauwens, Pimlico—Candles.

Dated 2nd August.

1807. M. T. Raymond, 25, Clement's-lane, Lombard-street—Retarding and stopping railway-trains.

Dated 28th September.

2219. M. Poole, Avenue-road, Regent's-park—Manufacture of pulp for paper-makers. (A communication.)

2221. J. Barsham, Kingston-upon-Thames—Bricks, tiles, and blocks.

2223. W. Hickson, Carlisle—Machinery for manufacturing and packing bread.

2225. W. E. Newton, 66, Chancery-lane—Machinery for cutting metal, &c. (A communication.)

2227. J. A. Labat, jun., Bourdeaux, and 16, Castle-street, Holborn—Stoppering vessels and bottles.

Dated 29th September.

2229. J. Phillips, Birmingham—Improvements in shaping vessels.

2231. F. J. Raux, Montmartre—Railway-brakes.

2232. J. Griffiths, Wolverhampton—Steam-engines.

2233. T. W. Kennard, Duke-street, Adelphi—Constructing piers and foundations under water.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

| Date of Registration. | No. in the Register. | Title. | Proprietor's Name. | Address. |
|-----------------------|----------------------|---|--------------------|---|
| Oct. 17 | 3520 | Rolled Bar of Rod-iron, for making Nails or Spikes. | William James..... | Crosby-hall Chambers, Bishopsgate-street. |

2234. H. Berdan, New York—Machine for preserving mercury in process of amalgamation, and for washing and amalgamating gold and other ores.

Dated 30th September.

2235. P. A. le Comte de Fontainemoreau, 4, South-street, Finsbury—Treating certain plants for production of a fibrous substance, called vegetable silk. (A communication.)

2236. J. Willis, Wallingford, Bucks—Gig harness.

2237. J. H. Johnson, 47, Lincoln's-inn Fields—Throwing ropes for preserving life. (A communication.)

2239. R. Brisco, Low Mill House, St. Bees, Cumberland, and P. S. Horsman, Beckermet—Machinery for heckling flax, hemp, &c.

WEEKLY LIST OF PATENTS SEALED.

Sealed 12th October, 1853.

871. Henry Blake, of Brighton—Improvements in railway wheels.

Sealed 13th October.

901. John Chadwick, of Manchester, and Thomas Dickins, of Spring Vale Works, near Middleton, Lancashire—Improvements in the production of raw and thrown silk.

925. Joseph Cooke and William Cooke, both of Birmingham—Invention of machinery for cutting or shaping corks and bungs.

926. George Albemarle Cator, of Selby, Yorkshire—Improvements in machinery for preparing flax, hemp, and other vegetable fibrous substances, for scutching or other manufacturing processes.

933. William McNaughten, of Aberdeen—Improvements in printing yarns or worsteds for weaving carpets; also in printing carpets, woolen, silk, cotton, and other textile fabrics or fibrous substances.

939. Thomas Newey, of Garbett-street, Birmingham—Improvements in fastenings for articles of dress.

959. Thomas Dunn, of Windsor-bridge Iron-works, Pendleton, near Manchester—Improvements in and applicable to boilers or apparatus for generating steam, and in apparatus connected therewith.

975. Jerome André Drieu, of Bowden, Cheshire—Improvements in cutting the pile of velvet, velveteens, and other piled fabrics.

1005. William Johnson, of Farnworth, near Bolton-le-Moors—Improvements in machinery for preparing and spinning cotton and other fibrous substances.

1045. Colin Mather, of Salford—Improvements in apparatus used in bleaching.

1089. Thomas Masters, of Oxford-street—Improvements in apparatus for freezing, cooling, and churning.

1258. William Chisholm, of Holloway—Improvements in the purification of coal-gas, for the purpose of illuminating and heating, and obtaining, by the ingredients used therefore, manures, salts of ammonia, and sulphur.

1709. Thomas Wood and George Wade, both of Sowerby-bridge, Yorkshire—Improvements in machinery or apparatus for opening, cleaning, carding, or otherwise preparing cotton, or other fibrous materials, to be spun.

1750. Charles Frederick Spieker, of New York—Improvements in generating and fixing ammonia.

1882. Edward Lavender and Robert Lavender, both of Deptford—Invention of an apparatus for preparing the materials employed in the manufacture of certain composition fire-lighters.

1928. Joseph Hart Mortimer, of Chester-place, Old Kent-road—Improvements in lamps.

1935. Peter Fairbairn, of Leeds—Improvements in heckling-machines.

Sealed 14th October.

899. Constant Jouffroy Daméry, of Paris—Improvements in the manufacture of paste and enamel buttons.

914. François Marie Antoine Serruys, of Bruxelles—Improvements in tanning. (A communication.)

916. George Titterton, of Margaret-street, Cavendish-square—Improvements in brushes.

918. William Allen, of Westbourne-street, Pimlico, and William Murrell, of Grosvenor-road, Pimlico—Improvements in the mode or modes of cleansing bottles or other similar articles.

920. William Edward Newton, of Chancery-lane—Improvements in treating refuse silk waste, and in converting it into a valuable product. (A communication.)

949. Andrew Blair, of Maryhill, Lanark—Improvements in propelling vessels.